ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	HASSLACHER Holding GmbH
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-HAS-20210170-IBD1-EN
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Valid to	02/08/2026

Solid structural timber
Structural finger jointed solid timber for load-bearing purposes according to EN 15497
GLT® – Girder longitudinally tensiletested according to ETA-13/0644, issued on 01.04.2019

HASSLACHER Holding GmbH

Institut Bauen und Umwelt e.V.

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From wood to wonders.

1. General Information

HASSLACHER Holding GmbH

Solid structural timber
Structural finger jointed solid timber
GLT® – Girder longitudinally tensiletested

Programme holder
IBU – Institut Bauen und Umwelt e.V.
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Germany

Owner of the declaration
HASSLACHER Holding GmbH
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9751 Sachsenburg
Austria

Declaration number
EPD-HAS-20210170-IBD1-EN

Declared product / declared unit
1 m³ solid structural timber with an average density of 470 kg/m³
(Moisture content at delivery = 15 %)

This declaration is based on the product category rules:
Solid wood products, 12.2018
(PCR checked and approved by the SVR)

Scope:
This document refers to average HASSLACHER solid structural timber and GLT® – girder longitudinally tensiletested manufactured at the production site in Preding (Austria). This EPD is valid for the entire solid structural timber production of the HASSLACHER group (100 %). A good representativeness of the declared average can be assumed.

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The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
The EPD was created according to the specifications of *EN 15804+A2*. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard *EN 15804* serves as the core PCR
Independent verification of the declaration and data according to *ISO 14025:2010*
☐ internally ☒ externally

Dipl. Ing. Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)

Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.))

Matthias Klingler
(Independent verifier)

2. Product

2.1 Product description/Product definition

Structural finger jointed solid timber from HASSLACHER Holding GmbH is an industrially manufactured product for load-bearing structures. It consists of kiln-dried, finger-jointed planks and squared timber made of softwood, which are graded visually or mechanically according to their strength. Adhesives according to 2.5 are used for bonding. Structural finger jointed solid timber is produced with a maximum wood moisture content of 18 %.

Structural finger jointed solid timber is supplied in dimensions according to 2.4 and with dimensional tolerances according to *EN 336*.
Structural finger jointed solid timber is highly dimensionally stable, especially due to stricter specifications regarding cutting and wood moisture content, and therefore tends to crack less than standard solid timber. Structural finger jointed solid timber can be produced with increased surface requirements compared to standard finger-jointed or non-jointed sawn timber.

Production is subject to in-house and external monitoring in accordance with *EN 15497*.

For the placing on the market of the product structural finger jointed solid timber in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration

ÖNORM EN 15497:2014-10-15, Structural finger jointed solid timber - Performance requirements and minimum production requirements and the CE-marking.

For the application and use the respective national provisions apply.

For the placing of the product GLT® – Girder Longitudinally Tensiletested on the market in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration ETA-13/0644 of 01.04.2019 regarding Strength graded finger-jointed structural timber GLT® and the CE-marking.
For the application and use the respective national provisions apply

Structural finger jointed solid timber from HASSLACHER Preding Holzindustrie GmbH is subjected to a tensile test load procedure and a test load is applied as part of this. Incorrect bonding in the finger joint as well as defects in the grading, which lead to low strength, can thus be detected through breakage and reliably eliminated.

GLT® – Girders Longitudinally Tensiletested are subjected to a tensile test stress of st,proof = 0.6 - ft,0,k. This higher tensile test stress enables more favourable dimensioning. The product, the internal and external monitoring as well as the dimensioning are regulated according to ETA-13/0644.

2.2 Application

Structural finger jointed solid timber is used as a load-bearing element in building and bridge construction. The use of preventive chemical wood preservation according to *DIN 68800-3* is unusual and only permissible if structural wood preservation according to *DIN 68800-2* alone is not sufficient. If, in exceptional cases, a preventive chemical wood preservative is used, this must be regulated by a general building authority approval or approval according to the Biocidal Products Regulation.

2.3 Technical Data

Structural data for structural finger jointed solid softwood timber according to *EN 15497* are given.

Structural data

Name	Value	Unit
Wood species according to EN 1912 and letter codes, if any, in accordance with EN 13556	PCAB (Norway spruce) ABAL (Silver fir) PNSY (Scots pine)	
Mean humidity acc. to EN 13183-1 2)	approx. 15	%
Use of wood preservatives (the test rating of the wood preservative according to DIN 68800-3 must be stated) 3)	Iv, P and W	-
Characteristic value of bending strength parallel to grain acc. to EN 338 and ETA-13/0644	24 | 24 kpl/ 1)	N/mm²
Characteristic value of compressive strength perpendicular to grain acc. to EN 338	2.5	N/mm²
Characteristic value of tensile strength parallel to grain acc. to EN 338 and ETA-13/0644	14 | 14 kpl/ 1)	N/mm²
Characteristic value of tensile strength perpendicular to grain acc. to EN 338	0.4	N/mm²
Mean characteristic value of modulus of elasticity parallel to grain acc. to EN 338 and ETA-13/0644	11.000 | 11.600	N/mm²
Characteristic value of shear strength acc. to EN 338	4.0	N/mm²
Mean characteristic value of shear modulus acc. to EN 338	690	N/mm²
Dimensional deviation acc. to EN 336	Dimensional tolerance class 2 width and height (< 100 mm): +/- 1 mm; width and height (> 100 mm): +/- 1.5 mm	mm
Surface quality	Visual quality, industrial visual quality	-
Thermal conductivity (perpendicular to grain) acc. to ISO 10456	12	W/(mK)
Specific heat capacity acc. to ISO 10456	1600	J/(kgK)
Water vapour diffusion resistance factor acc. to ISO 10456 4)	μ = 50 (dry) to 20 (wet)	-

1) kpl…Test load coefficient acc. to *ETA-13/0644*
2) *EN 15497* allows for different equivalent measurement methods.
3) According to *DIN 68800-1*, wood preservative treatment is only permissible if structural measures have been exhausted and is therefore unusual.
4) The water vapour diffusion equivalent air layer thickness is determined from the product of the layer thickness with the water vapour diffusion resistance number.

Performance data of the product structural finger jointed solid timber in accordance with the declaration of performance with respect to its essential characteristics according to *ÖNORM EN 15497:2014-10-15, Structural finger jointed solid timber - Performance requirements and minimum production requirements* (not part of CE marking).

Performance data of the product GLT® – Girder Longitudinally Tensiletested in accordance with the declaration of performance with respect to its essential characteristics according to ETA-13/0644, *Strength graded finger-jointed structural timber GLT®* (not part of CE marking).

2.4 Delivery status
The product is produced in the following sizes:
Min. height: 60 mm
Max. height: 300 mm
Min. width: 50 mm
Max. width: 160 mm
Stock lengths: 13 m
Custom lengths: 2.5 m to 18.0 m possible.

2.5 Base materials/Ancillary materials
Structural finger jointed solid timber is made from fibre-parallel, technically dried planks or squared timber made of bonded softwood. Polyurethane adhesives (PUR) are used for bonding. The emission of formaldehyde is declared according to *EN 14080*.
The averaged proportions of ingredients per m³ of solid construction timber for the environmental product declaration are:
- Softwood, predominantly spruce, approx. 85 %
- Water approx. 15 %
- PUR adhesives < 0.1 %

The product has an average density of 470 kg/m³.

This product/article/at least one partial article contains substances listed in the candidate list (19.01.2021) exceeding 0.1 percentage by mass: no.

This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no.

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): no.

2.6 Manufacture
For the production of structural finger jointed solid timber, conventional sawn timber is first dried to below 18 % wood moisture (target moisture content: approx. 15 %), pre-planed and graded visually, but mainly by machine, according to strength. Identified areas with strength-reducing spots are cut out depending on the desired strength class. In the case of structural finger jointed solid timber, the resulting sawn timber sections are joined by finger-joints to form endless lamellas. Structural finger jointed solid timber from HASSLACHER Preding Holzindustrie GmbH is subjected to a tensile test load procedure after curing. If the tensile test is passed with a positive result, the profiles are planed, chamfered, tied and packed. If required, treatment with wood preservatives or a surface finish or even joinery work can be carried out.

2.7 Environment and health during manufacturing
Accruing exhaust air is purified in accordance with legal requirements. No pollution of water and soil takes place. The resulting waste water is fed into the local sewage system.

2.8 Product processing/Installation
Structural finger jointed solid timber can be processed with suitable tools commonly used in solid timber processing. On request, products can also be processed on both sides in the factory.
Occupational safety instructions must also be observed during processing/assembly.

2.9 Packaging
Polyethylene, solid timber, paper and cardboard as well as small amounts of other plastics are used.

2.10 Condition of use
The composition for the period of use corresponds to the basic material composition according to section 2.5 "Base materials/Ancillary materials".
During use, about 210 kg of carbon are bound within the product. This corresponds to about 750 kg CO_2 in the case of complete oxidation.

2.11 Environment and health during use
Environmental protection: According to the current state of knowledge, hazards to water, air and soil cannot arise if the products are used as intended.

Health protection: According to the current state of knowledge, no health hazards or impairments are to be expected.
With regard to formaldehyde, structural finger jointed solid timber is low in emissions due to its low adhesive content, its structure and its form of use.
Structural finger jointed solid timber bonded using PUR adhesives has formaldehyde emission values that meet *EN 15497* in the range of natural wood, around 0.004 ml/m³.
MDI emissions are not measurable in structural timber bonded using PUR adhesives within the detection limit of 0.05 µg/m³. Due to the high reactivity of MDI with water (air and wood moisture), it can be assumed that structural finger jointed solid timber bonded in this way shows an emission of MDI in the range of the zero value a short time after manufacture.

2.12 Reference service life
Structural finger jointed solid timber corresponds to glued laminated timber (glulam) lamellas in its components and production. Glued laminated timber has been used for over 100 years. In addition to in-house and external monitoring, structural finger jointed solid timber from HASSLACHER PREDING Holzindustrie GmbH is also subjected to a tensile test load procedure for online quality assurance of the finger joints and the product.
When used as intended, no end to its durability is known or to be expected.
The service life of structural finger jointed solid timber is therefore the same as the service life of the building when used as intended.

2.13 Extraordinary effects

Fire
Fire performance acc. to *EN 13501-1*
- Fire classification D – normal flammable, smoke class s2 – normal smoke production
- Flaming droplets d0 – no dripping
- The toxicity of the fire gases corresponds to that of natural wood.

Structural fire resistance
The burn rate of structural finger jointed solid timber/GLT® is 0.8 mm/min.

Water
No ingredients are washed out that may be hazardous

to water.

Mechanical destruction
The break pattern of structural finger jointed solid timber shows an appearance typical of solid timber.

2.14 Re-use phase
In the case of selective deconstruction, structural finger jointed solid timber can be re-used or re-utilised without any problems after the end of the utilisation phase in the sense of cascading utilisation ("re-use"). If it is not possible to reuse or re-utilise structural finger jointed solid timber, it can be thermally recycled to generate process heat and electricity due to its high calorific value of approx. 19 MJ/kg.

2.15 Disposal
It is impermissible to dispose of waste wood via landfills.

Waste classification: Classification code 17218 (Wood waste, organically treated) according to the Waste Catalogue in accordance with Annex 5 of the Austrian *Waste Catalogue Ordinance;* Waste Code according to the *European Waste Catalogue (EWC)*: 17 02 01.

2.16 Further information
You can find further information at www.hasslacher.com

3. LCA: Calculation rules

3.1 Declared Unit
This EPD refers to a declared unit of 1 m³ HASSLACHER solid structural timber with an average density of 470 kg/m³ at 15 % moisture at delivery.

Declared Unit

Name	Value	Unit
Declared unit	1	m^3
Gross density	470	kg/m^3
Wood moisture at delivery	15	%
Conversion factor to 1 kg [Mass/Declared Unit]	470	-

HASSLACHER solid structural timber is manufactured at the Preding site (Austria) of the HASSLACHER group. The declared unit was calculated on a volume-weighted basis. This EPD refers to an average product manufactured at one site. All products undergo the same processing steps. A possible variability is only expected due to the use of different wood species. The upstream chain for spruce is considered as representative. The robustness of the declared LCA values can thus be classified as high.

3.2 System boundary
The life cycle assessment of HASSLACHER solid structural timber refers to a cradle-to-gate analysis of the environmental impacts with modules C1-C4 and D (A1-A3, + C, +D). The following life cycle phases are taken into consideration in the analysis:

Module A1-A3 | Production stage
The production stage includes the upstream burdens of raw material supply (sawn timber, production of the adhesive system, etc.) and their transports to the manufacturing plant in Preding. Sorting, planing, finger-jointing, chamfering and joining, including the packaging of the product, are taken into account. The share of electricity demand covered by green electricity is 100 % (emission factor GWP-total: 13 g CO_2 equivalent/kWh). Thermal energy is provided from the energetic use of wooden residues from the production process.

Module C1 | Deconstruction and demolition
After the removal of building components overlying the product, the joints can simply be loosened by screwing or sawing and lifted by cranes to the place of removal. Required energy demand can be neglected. The actual energy demand depends on the installation of the products and can therefore vary greatly in the building context.

Module C2 | Transport to disposal
Module C2 includes the transport to waste treatment. In this case, transport by truck over a transport distance of 50 km is assumed.

Module C3 | Waste processing
In Module C3, the chipping after removal of the products is considered. The wooden products and with them the material-inherent properties leave the product system as secondary combustibles in module C3.

Module C4 | Disposal
The applied scenario declares the energetic recovery of the wooden products, therefore no environmental impacts are to be expected from waste processing of the products in C4.

Module D | Benefits and loads beyond the system boundary
Applying an European average scenario, module D describes the energetic recovery of the product at the end-of-life including the corresponding energy substitution potentials.

3.3 Estimates and assumptions
Assumptions and approximations are applied in case of a lack of representative data. All assumptions and approximations are documented precisely and represent a best-guess representation of reality.

A large part of the wood processed by HASSLACHER represents softwood. A generic data set from the *GaBi* database for spruce round timber was used as background data set. For other wood species used, the data set for spruce is regarded as an approximation.

Emissions from wood drying were included in the calculations according to *Rüter & Diederichs* (2012).

3.4 Cut-off criteria
The LCA model covers all available input and output flows, which can be represented based on robust data and from which a significant contribution can be expected. Data gaps are filled with conservative assumptions of average data or generic data if available and are documented accordingly.
Only data with a contribution of less than 1 % were cut off. Thus, no data were neglected, of which a

substantial impact is to be expected. All relevant data were collected comprehensively. Cut-off material and energy flows were chosen carefully based on their expected quantitative contribution as well as potential environmental impacts. Thus, it can be assumed that the sum of all neglected input flows does not account for more than 5 % of the total material, water and energy flows.

3.5 Background data

This study uses generic background data for the evaluation of upstream environmental impacts from *GaBi* database 2021.1 as well as recognised literature such as *Rüter & Diederichs* 2012.

3.6 Data quality

Data collection is based on industry-specific questionnaires. It follows an iterative process clarifying questions via e-mail, telephones calls or in personal and online meetings.
Intensive discussions between HASSLACHER and Daxner & Merl result in an accurate mapping of product-related material and energy flows. This leads to a high quality of foreground data collected. Data collection relies on a consistent process according to *ISO 14044*.

The technological, geographical, and time-related representativeness of the database was kept in mind when selecting background data. Whenever specific data were missing, either generic datasets or representative average data were used instead. The implemented *GaBi* background datasets refer to the latest versions available (not more than ten years old) and are carefully chosen.

3.7 Period under review

Foreground data were collected in the 2019 production year, and the data are based on the volumes produced on an annual basis.

3.8 Allocation

Carbon content and primary energy content of the products were assessed based on their material-inherent properties according to underlying physical relationships.
The allocation in the upstream supply chain of wooden products is based on the publication by *Hasch* 2002 and its update by *Rüter & Albrecht* 2007.

During the production co-products such as off-cuts, chips, cross-cutting and planing losses are produced in addition to the declared product. Co-products are allocated based on their market price in accordance with the recommendations of *EN 16485*.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The *GaBi* background database was used to calculate the LCA (*GaBi* 10; 2021.1).

4. LCA: Scenarios and additional technical information

Characteristic product properties
Information on biogenic Carbon

During tree growth, the wood assimilates carbon dioxide and stores biogenic carbon. The carbon stored in the product is declared in the following table.

Information ondescribing the biogenic carbon content at the factory gate

Name	Value	Unit
Biogenic Carbon Content in product	206	kg C

As the packaging amounts to far less than 5 % of the product mass, the biogenic carbon stored in the packaging does not have to be declared in the EPD.

End of Life (C1-C4)

Name	Value	Unit
Energy recovery	470	kg

Reuse, recovery, and recycling potential (D), relevant scenario information

Name	Value	Unit
Processing rate	100	%
Efficiency of the plant	61	%

The product reaches the end of its waste status after removal from the building, transport to processing and chipping of the product. For the end of life of the HASSLACHER solid wood products, energy recovery as secondary fuel in a biomass power plant is assumed. As the main sales market for HASSLACHER products is concentrated in the European region, plant-specific characteristic values correspond to a European average scenario (EU28). The scenario considers a reprocessing rate of 100 % for the solid wood products after removal from the building. This assumption has to be adjusted accordingly when applying the results in the building context. At the end-of-life of the product, the equilibrium moisture is comparable to the moisture content at delivery. This value can vary depending on the storage of the product before energy recovery.

5. LCA: Results

The following table contains the life cycle assessment results for a declared unit of 1 m³ HASSLACHER solid structural timber with an average density of 470 kg/m³ (approx. 15 % moisture content).

Disclaimer:
EP-freshwater: This indicator has been calculated as “kg P eq” as required in the characterization model (EUTREND model, Struijs et al., 2009b, as implemented in ReCiPe; http://eplca.jrc.ec.europa.eu/LCDN/developerEF.xhtml)

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; ND = MODULE OR INDICATOR NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	ND	ND	ND	ND	MNR	MNR	MNR	ND	ND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m³ solid structural timber (470 kg/m³)

Core Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Global warming potential - total	[kg CO_2-Eq.]	-6.96E+2	0.00E+0	1.42E+0	7.59E+2	0.00E+0	-4.19E+2
Global warming potential - fossil fuels	[kg CO_2-Eq.]	5.67E+1	0.00E+0	1.41E+0	3.74E+0	0.00E+0	-4.08E+2
Global warming potential - biogenic	[kg CO_2-Eq.]	-7.53E+2	0.00E+0	-1.67E-3	7.56E+2	0.00E+0	-1.08E+1
GWP from land use and land use change	[kg CO_2-Eq.]	4.63E-1	0.00E+0	1.15E-2	5.29E-3	0.00E+0	-3.19E-1
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.34E-6	0.00E+0	2.77E-16	8.95E-14	0.00E+0	-5.32E-12
Acidification potential, accumulated exceedance	[mol H^+-Eq.]	4.55E-1	0.00E+0	4.66E-3	7.78E-3	0.00E+0	3.05E-1
Eutrophication, fraction of nutrients reaching freshwater end compartment	[kg PO_4-Eq.]	1.81E-3	0.00E+0	4.17E-6	1.00E-5	0.00E+0	-6.05E-4
Eutrophication, fraction of nutrients reaching marine end compartment	[kg N-Eq.]	1.94E-1	0.00E+0	2.14E-3	1.85E-3	0.00E+0	5.77E-2
Eutrophication, accumulated exceedance	[mol N-Eq.]	1.93E+0	0.00E+0	2.39E-2	1.94E-2	0.00E+0	6.98E-1
Formation potential of tropospheric ozone photochemical oxidants	[kg NMVOC-Eq.]	5.23E-1	0.00E+0	4.20E-3	5.01E-3	0.00E+0	2.62E-1
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.53E-5	0.00E+0	1.25E-7	1.10E-6	0.00E+0	-7.47E-5
Abiotic depletion potential for fossil resources	[MJ]	7.46E+2	0.00E+0	1.87E+1	6.65E+1	0.00E+0	-7.17E+3
Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	[m³ world-Eq deprived]	1.06E+1	0.00E+0	1.30E-2	6.00E-1	0.00E+0	-1.05E+1

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m³ solid structural timber (470 kg/m³)

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Renewable primary energy as energy carrier	[MJ]	2.00E+3	0.00E+0	1.08E+0	7.68E+3	0.00E+0	-1.83E+3
Renewable primary energy resources as material utilization	[MJ]	7.65E+3	0.00E+0	0.00E+0	-7.65E+3	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	9.65E+3	0.00E+0	1.08E+0	3.06E+1	0.00E+0	-1.83E+3
Non-renewable primary energy as energy carrier	[MJ]	7.13E+2	0.00E+0	1.88E+1	6.65E+1	0.00E+0	-7.17E+3
Non-renewable primary energy as material utilization	[MJ]	3.37E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	7.47E+2	0.00E+0	1.88E+1	6.65E+1	0.00E+0	-7.17E+3
Use of secondary material	[kg]	1.22E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.65E+3
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m³]	8.10E-1	0.00E+0	1.23E-3	2.98E-2	0.00E+0	-1.20E+0

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1 m³ solid structural timber (470 kg/m³)

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste disposed	[kg]	2.00E-6	0.00E+0	9.90E-10	1.76E-8	0.00E+0	-1.61E-6
Non-hazardous waste disposed	[kg]	1.80E+0	0.00E+0	2.95E-3	4.72E-2	0.00E+0	2.72E-1
Radioactive waste disposed	[kg]	1.61E-2	0.00E+0	3.41E-5	9.90E-3	0.00E+0	-5.89E-1
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	4.70E+2	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m³ solid structural timber (470 kg/m³)

Indicator	Unit	A1-A3	C1	C2	C3	C4	D
Potential incidence of disease due to PM emissions	[Disease Incidence]	ND	ND	ND	ND	ND	ND
Potential Human exposure efficiency relative to U235	[kBq U235-Eq.]	ND	ND	ND	ND	ND	ND
Potential comparative toxic unit for ecosystems	[CTUe]	ND	ND	ND	ND	ND	ND
Potential comparative toxic unit for humans - cancerogenic	[CTUh]	ND	ND	ND	ND	ND	ND
Potential comparative toxic unit for humans - not cancerogenic	[CTUh]	ND	ND	ND	ND	ND	ND
Potential soil quality index	[-]	ND	ND	ND	ND	ND	ND

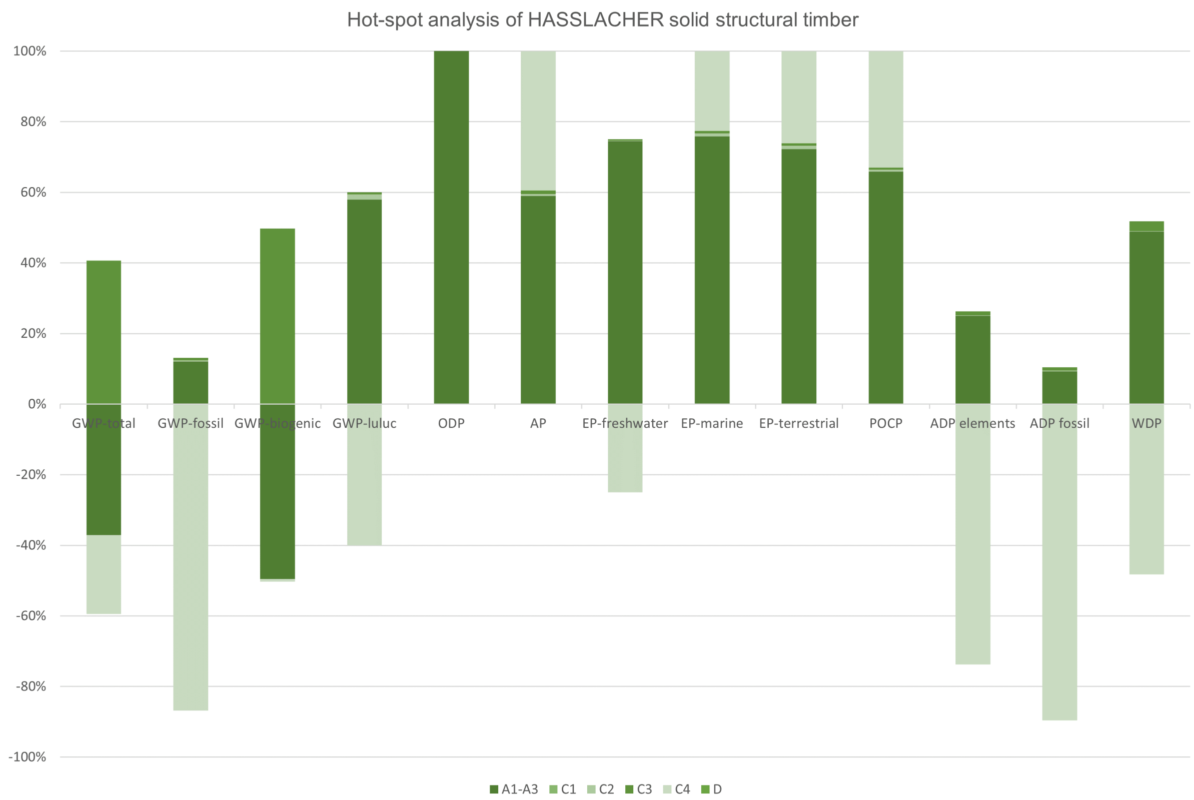
The additional and optional impact categories according to *EN 15804+A2* are not declared, as this is not required according to *PCR Part A*.

Disclaimer 1 – for the indicator "potential Human exposure efficiency relative to U235":
This impact category deals mainly with the eventual impact of low dose ionizingradiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators: "abiotic depletion potential for fossil resources", "abiotic depletion potential for non-fossil resources", "water (user) deprivation potential", "deprivation-weighted water consumption", "potential comparative toxic unit for ecosystems", "potential comparative toxic unit for humans - cancer effects", "potential comparative toxic unit for humans – non-cancer effects", "potential soil quality index":
The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with the indicator.

6. LCA: Interpretation

The following interpretation contains a summary of the LCA results related to a declared unit of 1 m³ of average HASSLACHER solid structural timber.



Global warming potential (GWP) shows a negative value in the production phase (modules A1-A3) of solid structural timber. This is due to the material use of wood in the production and the sequestration of biogenic carbon in wood. Trees use carbon dioxide from the atmosphere in order to grow and thus bind carbon in their biomass (negative GWP).

During the energetic treatment in a combined heat and power plant at the End-of-Life (module C3) the bound biogenic carbon is released to the atmosphere as carbon dioxide and thus contributes to potential global warming.

The negative values in module D can be explained by the fact that the energy generated by the energetic

utilization of the product can replace the combustion of fossil energy sources. Thus, more emissions of (mainly fossil) energy sources are avoided than are emitted by using the energy stored in the wood.
Environmental burdens (AP, EP, POCP) in module D are mainly caused by emissions from the combustion of biomass.

The interpretation of the results identifies the impacts from the upstream supply chain of sawn timber as the main driver in the environmental profile of solid structural timber. The environmental impacts from forestry play an important role. Due to the use of green electricity in production, the provision of electricity at the site represents a minor contribution factor (except for the elementary use of resources).

The results presented refer to solid structural timber produced at the Stall (AT) site. A variance in the product-related environmental impacts is mainly to be expected from the types of wood used, possible differences in the associated forestry process and the associated density of the products. The processed assortments are softwoods, primarily spruce and fir. This was considered accordingly in the declared density and chosen background data sets.

The scope of validity refers to the entire solid structural timber production of the HASSLACHER Group (100 %). A good representativeness of the declared average can be assumed.

7. Requisite evidence

7.1 Formaldehyde

Since only formaldehyde-free PUR adhesive is used for the production of structural finger jointed solid timber and GLT®, the area-specific emission rates of formaldehyde are in the range of unglued timber.

7.2 MDI

When bonding structural finger jointed solid timber, the MDI contained in the moisture-curing one-component polyurethane adhesives used reacts out completely. Cured structural finger jointed solid timber therefore emits no MDI emissions.
In tests based on the measurement methodology for determining formaldehyde emission acc. to *ISO 12460-3*, MDI emissions cannot be detected (detection limit: 0.05 µg/m³).

7.3 Toxicity of fire gases

The toxicity of the combustion gases produced by burning finger jointed solid wood corresponds to those produced by burning untreated wood.

7.4 VOC-emissions

Testing entity
Holzforschung Austria – Österreichische Gesellschaft für Holzforschung

Place of test
Franz-Grill-Straße 7, A-1030 Vienna

Test report and test period
Test report no. 1414/2021 - HC
Test period 11.05.2021 to 28.06.2021

Test method and result
Measurement of the emissions of a sample with respect to VOC, formaldehyde and short-chain carbonyl compounds according to *EN 16516*.

AgBB-result overview (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16) (substance spec.)	127	µg/m³
TVOC (Toluene eq.)	120	µg/m³
R (dimensionless)	0.09	-
Formaldehyde	3.6	µg/m³

AgBB-result overview (3 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16) (substance spec.)	268	µg/m³
TVOC (Toluene eq.)	243	µg/m³
Formaldehyde	8.6	µg/m³

8. References

Standards

DIN 68800-1
DIN 68800-1:2019-06, Wood preservation – Part 1: General. Wood preservation – Part 2: Preventive constructional measures in buildings.

DIN 68800-2
DIN 68800-2:2012-02, Wood preservation – Part 2: Preventive constructional measures in buildings.

DIN 68800-3
DIN 68800-3:2020-03, Wood preservation – Part 3: Preventive protection of wood with wood preservatives.

EN 336
ÖNORM EN 336:2013-11-15, Structural timber - Sizes, permitted deviations.

EN 338
ÖNORM EN 338:2016-06-01, Structural timber – strength classes.

EN 717-1
ÖNORM EN 717-1:2005-02-01, Wood-based panels – Determination of formaldehyde release – Part 1: Formaldehyde emission by the chamber method.

EN 1912
ÖNORM EN 1912:2013-10-15, Structural timber – Strength classes – Assignment of visual grades and species.

EN 13183-1
ÖNORM EN 13183-1:2004-02-01, Moisture content of a piece of sawn timber - Part 1: Determination by oven dry method.

EN 13501-1
ÖNORM EN 13501-1:2020-01-15, Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests.

EN 13556
ÖNORM EN 13556:2003-09-01, Round and sawn timber. Nomenclature of timbers used in Europe.

EN 14080
ÖNORM EN 14080:2013-08-01, Timber structures – glued laminated timber and glued solid timber – Requirements.

EN 15497
ÖNORM EN 15497:2014-10-15, Structural finger jointed solid timber - Performance requirements and minimum production requirements.

EN 15804
DIN EN 15804:2012+A2:2019, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

EN 16485
ÖNORM EN 16485:2014-05-01, Round and sawn timber - Environmental Product Declarations - Product category rules for wood and wood-based products for use in construction.

EN 16516
DIN EN 16516:2020-10, Construction products: Assessment of release of dangerous substances - Determination of emissions into indoor air.

ISO 10456
ÖNORM EN ISO 10456:2010-02-15, Building materials and products - Hygrothermal properties - Tabulated design values and procedures for determining declared and design thermal values.

ISO 12460-3
ÖNORM EN ISO 12460-3:2021-03-01, Wood-based panels – Determination of formaldehyde release – Part 3: Gas analysis method.

ISO 14025
DIN EN ISO 14025:2011-10, Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

ISO 14044
DIN EN ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines.

ETA-13/0644
ETA-13/0644 vom 01.04.2019,
European Technical Assessment for strength graded finger-jointed structural timber GLT®.

Further References

Waste Catalogue Ordinance
Waste Catalogue according to Annex 5 of the Austrian Waste Catalogue Ordinance. Order of the Federal Minister for Sustainability and Tourism on a Waste Catalogue (Waste Catalogue Ordinance 2020).

AgBB
German Committee for Health-Related Evaluation of Building Products (AgBB): Approach to health assessment of emissions of volatile organic compounds (VOCs and SVOCs) from building products.

Biocidal Products Regulation
Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products.

CPR
Regulation (EU) No. 305/2011 of the European Parliament and the Council of 9 March 2012 laying down harmonised conditions for the marketing of the construction products and on repealing Directive 89/106/EEC of the Council.

EWC
EWC European Waste Catalogue – EWC, Ordinance on the European Waste Catalogue (Waste Catalogue Ordinance) Waste Catalogue Ordinance of 10 December 2001 (BGBl. I S. 3379), last amended by Article 5 para. 22 of the law dated 24. February 2012 (BGBl. I S. 212).

ECHA Candidate List
List of substances of very high concern considered for approval (status 19.01.2021) according to Article 59 para. 10 of the REACH Regulation. European Chemicals Agency.

GaBi
GaBi 10, Software-System and Database for Life Cycle Engineering. DB v8.7 2020.2. Stuttgart, Echterdingen: Sphera, 1992-2020. Verfügbar in: http://documentation.gabi-software.com.

Hasch 2002, Rüter & Albrecht 2007
Ökologische Betrachtung von Holzspan und Holzfaserplatten, Diss., University of Hamburg, amended in 2007: Rüter, S. (BFH HAMBURG; Timber Technology), Albrecht, S. (University of Stuttgart, GaBi).

Holz Forschung Austria
Holz Forschung Austria, VOC emission test report acc. to EN 16516 (28.06.2021), number: 1414/2021 - HC.

IBU 2021
Institut Bauen und Umwelt e.V.: General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V. (IBU). Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021.
www.ibu-epd.com

PCR part A
Product category rules for building-related products and services. Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019. Version 1.1. Berlin: Institut Bauen und Umwelt e.V., 2021.

PCR: Solid wood products
Product category rules for building-related products and services. Part B: EPD requirements for solid wood products. Version 1.1. Berlin: Institut Bauen und Umwelt e.V., 10.12.2018.

Rüter & Diederichs 2012
Ökobilanz-Basisdaten für Bauprodukte aus Holz. Work report from the Institut für Holztechnologie und Holzbiologie Nr. 2012/1. Hamburg: Johann Heinrichvon Thünen-Institut.

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